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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,802	10/22/2003	Dan W. Pratt	COR-1075-US	6673

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PAUL S MADAN
MADAN, MOSSMAN & SRIRAM, PC
2603 AUGUSTA DRIVE, SUITE 700
HOUSTON, TX 77057-5662

EXAMINER	
BERGIN, JAMES S	

ART UNIT	PAPER NUMBER
3641	

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01/25/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/691,802	PRATT ET AL.	
	Examiner	Art Unit	
	James S. Bergin	3641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21,23-31 and 33-46* is/are pending in the application.

4a) Of the above claim(s) *1-19,24,26-31 and 39-42* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20,21,23,25,33-38 and 43-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 20 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a shaped charge device comprising: a) liner formed of a particulated filler material, such as powdererd aluminum; and b) a **metal cap disposed upon the liner**, the jet produced by the explosion of the device forming a jet having a forward portion and a substantially particulated portion of lower density than the forward portion, does not reasonably provide enablement for a shaped charge device that does not include a metal cap . The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention *commensurate in scope* with these claims. The specification does not describe an embodiment of the shaped charge device that does not have a **metal cap disposed upon the liner**, and that is still capable of producing a jet having a forward portion and a substantially particulated portion of lower density than the forward portion. **Without the metal cap being disposed upon the liner, the jet produced by the detonation of the cap-less liner would be comprised only of the lower density particulated material. Such a claimed embodiment that that would**

remain capable of performing the function of claim 20 is outside the scope of independent claim 20.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 20, 21, 23, 25, 33-38 and 43-46 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 20, it is unclear whether the substantially particulated portion of the jet comprises particles of molten material (liquid state) or particles of non-molten material (solid particles). Inherently it would seem that the detonation of the charge transforms the filler material of the liner into a molten jet (liquid state) comprising particles of molten (liquid) material.

In claims 21, it is unclear how the limitation, "*filler material*" can properly refer to the particulated portion of the jet post-explosion? From reading the specification, it would appear that the term "*filler material*" properly refers to the particulated of the liner pre-explosion of the charge. The explosion of the charge converts the filler material of the liner into the particulated portion of the jet.

Claim 20, 21, 23, 25 and 34-38 are rejected as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted essential elements are: a metal cap disposed upon the liner. Absent the metal cap disposed upon the liner, it is unclear how, upon detonation

of the shaped charge device, a jet is produced that comprises a forward portion and a substantially particulated portion of lower density than the forward portion? **Without the metal cap being disposed upon the liner, the jet produced by the detonation of the cap-less liner would be comprised only of the lower density particulated material, and would not be capable of functioning as claimed in independent claim 20 and/or as disclosed.**

5. Claims 43-46 are indefinite as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted essential structural cooperative relationships are: the liner comprising the particulated filler material (see Figs. 1-3, the elected Species A, and the related sections of the specification). Without the liner comprising the particulated filler material, it is unclear how the shaped charge structure would function as intended?

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 20, 21, 23, 25, 33-38 and 43-46 are rejected under 35 U.S.C. 102(a & e) as being clearly anticipated by Liu (US 2003/0037692 A1). The following rejections are maintained in the light of the 112 1st and 112 2nd paragraph rejections outlined above.

Liu clearly anticipates the applicants' claimed invention and discloses a shaped charge for perforating a stimulating subterranean comprising a metal cap layer 11 that forms a leading penetrating metal precursor portion of the jet, the cap layer 11 formed from tungsten, iron, tin, copper, lead etc., and liner layer 12 formed from compacted aluminum powder, that forms the following less dense portion of the jet that penetrates the formation and reacts completely with water to create a powerful explosion in the perforation (see Liu, paragraph [0137] - [0143]; figs. 6, 7, 8A and 8B). It is inherent to Liu that the less dense portion of the jet formed from the aluminum powder is not formed as a completely solid non-particulated jet of molten material, but instead comprises a substantially particulated jet of molten material. Note that the applicants' are not claiming a specific particulate size for the particles of the particulated potion of the jet, or whether the jet comprises a particulated jet of molten material (liquid state) or a particulated jet of non-molten solid material.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 20, 21, 23, 25, 33-38 and 43-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Powell (US 6,786,157 B1) in view of Liu (US 2003/0037692 A1). The following rejections are maintained in the light of the 112 1st and 112 2nd paragraph rejections outlined above.

Regarding claims 20, 33 and 43, Powell discloses a shaped charge 10 explosive device (see abstract; Fig. 1) comprising a charge case 2 (Fig. 1) inherently adapted to be positioned in a perforating gun (col. 8, lines 13-30); an explosive charge 18; a liner 22, 32; a powdered aluminum filling 45 located in the liner cavity (col. 4, lines 5-37); the liner upon detonation of the explosive charge is driven in the same way as that of a conventional shaped charge liner forming a highly energetic, non-cohesive stream (jet) of particles (col. 2, lines 39-47).

Powell does not specifically disclose that the stream (jet) has a forward portion that is denser than the following particulated steam (jet) of particles or that Powell's penetrator comprises a metal cap disposed upon the liner.

Liu discloses a shaped charge for perforating a stimulating subterranean formation (paragraphs [0137] – [0140], Figs. 6, 7, 8A and 8B) comprising a metal cap layer 11 that forms a leading penetrating metal precursor portion of the jet, the cap layer 11 formed from tungsten, iron, tin, copper, lead etc.

In view of Liu, it would have been obvious to one of ordinary skill in the art at the time that the invention was made to include a metal cap layer disposed upon Powell's liner, thereby providing Powell's particulated stream (jet) with a more dense leading metal portion with enhanced penetrative properties.

Regarding claims 21, 23, 35, and 44, the particulated portion of Powell's jet is formed from powdered aluminum (col. 4, lines 5-37; col. 2, lines 39-47) which inherently has a density of less than 2.7g/cc (note applicants' admission on page 9 of the specification regarding the density of aluminum), which would inherently approximate the density of an oil bearing formation in a downhole environment.

Regarding claim 25, Powell's liner membranes 22, 32 are conical (Fig. 1; col. 4, lines 17-20).

Regarding claim 34, it is inherent to Powell that the liner forming a precursor jet is conformal to the charge case.

Regarding claims 36, 37, 38, 45, and 46 Powell discloses that the shaped charge can be used in a downhole environment for cutting wellbore casings "*narrow bore, thick walled pipes, typical of well liners and drilling shafts*" (col. 8, lines 13-30). When used in a downhole environment, Powell's perforator as modified by Liu **would inherently perforate the subterranean formation** and the particulated portion of the Powells' jet would inherently increase in temperature and inherently reduce intersititial fluid viscosity upon penetration into the subterranean formation.

Response to Arguments

10. Applicant's arguments filed 12/21/2007 have been fully considered but they are not persuasive. See the revised 112 1st and 112 2nd rejections outlined above.

11. Applicant's arguments filed 6/11/2007 and 12/21/2007 have been fully considered but they are not persuasive. The examiner maintains the rejection of the claims under 35 USC 103(a) as being unpatentable over Powell (US 6,786,157 B1) in view of Liu (US 2003/0037682 A1). As indicated in the final rejection mailed 8/29/2006, the motivation to include a metal cap layer disposed upon Powell's liner so as to provide Powell's particulated jet with a more dense leading metal portion with enhanced penetrative/ cutting properties is properly found in Liu . The examiner is not proposing that Powell's modified shaped charge be used in avalanche control, but instead be used in Powell's disclosed "downhole" applications. Powell and Liu comprise analogous art and Powell discloses that the shaped charge can be used in a downhole environment such as for cutting wellbore casings "narrow bore, thick walled pipes, typical of well liners and drilling shafts" (see Powell, col. 8, lines 13-30). Powell's shaped charge, as modified by the addition of a metal cap, as taught by Liu, **would possess enhanced cutting/ penetrative properties for cutting/ penetrating well liner pipe either above ground, or when lowered into the well bore** while attached to a perforating gun, as is well known in the art. Cutting a well bore pipe inherently involves **penetrating through** the body of the pipe during the cutting process. **Powell's liner as modified by Liu would possess enhanced pipe cutting properties (cutting that inherently includes penetrating through the pipe)**.

The examiner maintains the rejection of claims 20, 21, 23, 25 and 33-38 under 35 U.S.C. 102(a & e) as being clearly anticipated by Liu (US 2003/0037692 A1). It is inherent to Liu that the less dense portion of the jet formed from the aluminum powder is

not formed as a completely solid non-particulated molten jet, but instead comprises a substantially particulated molten jet. Note that the applicants' are not claiming a specific particulate size for the particles of the particulated potion of the jet.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Bergin whose telephone number is 571-272-6872. The examiner can normally be reached on Monday - Wednesday and Friday, 8.30 - 5.30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached on 571-272-6873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James S. Bergin/
Primary Examiner, Art Unit 3641